

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (Currently Amended) A system for transferring semiconductor workpieces ~~wafers and related substrate objects~~ between a wafer workpiece carrier having a carrier door and a processing tool carrier shell, ~~and an environment isolated from outside ambient conditions,~~ comprising:

a ~~unified frame, including at least two~~ having a first vertical strut struts and a second vertical strut spaced apart and each mounted to a lower support member providing a port door/carrier door storage compartment and plurality of mounting surfaces and an upper support member, said frame defining at least one a perimeter of an I/O port and a port door/carrier door storage area;

~~a carrier docking/isolation~~ an isolation plate having an opening, said isolation plate removably mounted to each said first and second vertical struts strut such that a semiconductor workpiece may travel through said opening in said isolation plate and said I/O port;

a carrier advance assembly mounted to one of said plurality of mounting surfaces of said lower support member, said carrier advance assembly including an advance plate for supporting the wafer carrier, and moving the wafer carrier between a first position and a second position ~~towards said carrier docking/isolation plate, and moving the wafer carrier away from said carrier docking/isolation plate;~~

a port door assembly ~~having including~~ a port door being adapted to couple with the carrier door and a port door drive mechanism mounted to said first vertical strut for moving said port door between said opening in said isolation plate and said port door/carrier door storage compartment; ~~said port door for engaging and mating with the carrier door, and said drive mechanism for moving said port door between said I/O port and said port door/carrier door storage area; and~~

a wafer workpiece handling robot for transferring the semiconductor workpieces between the workpiece carrier and the processing tool. mounted to said lower support

~~member and positioned within the environment isolated from outside ambient conditions.~~

2. (Currently Amended) The system as recited in claim 1, wherein said second vertical struts strut includes a guide mechanism for movably guiding said port door between said opening in said isolation plate and said port door/carrier door storage compartment. ~~are substantially parallel to each other.~~

3. (Canceled)

4. (Currently Amended) The system as recited in claim 1 3, wherein said ~~carrier docking/isolation~~ isolation plate is comprises a substantially transparent material.

5-7. (Canceled)

8. (Currently Amended) A An Equipment Front End Module (EFEM) system for transferring semiconductor wafers ~~and related substrate objects~~ between a wafer carrier having a carrier door and a ~~carrier shell, and~~ processing tool ~~an environment isolated from outside ambient conditions,~~ comprising:

a ~~unified frame~~ having a first vertical strut and a second vertical strut each mounted to a lower support member and an upper support member, said lower support member providing a port door storage compartment and a plurality of mounting surfaces each adapted to receive a front end tool component ~~providing an interior mounting surface and an exterior mounting surface that front end load components mount to, said exterior mounting surface being exposed to ambient outside conditions, and said interior mounting surface being isolated from ambient outside conditions, said unified frame creating at least one~~ defining an I/O port and a carrier door/port door storage area;

a carrier advance assembly mounted to ~~said exterior mounting surface;~~ one of said plurality of mounting surfaces of said lower support member, said carrier advance assembly including an advance plate for supporting the wafer carrier and moving the wafer carrier between a first position and a second position;

an isolation ~~a carrier docking/isolation plate~~ having an opening, said isolation plate removably mounted to said exterior mounting surface; first and second vertical struts;

~~a wafer engine mounted to said interior mounting surface; and~~

~~a port door assembly having including a port door being adapted to couple/uncouple with the carrier door and a port door drive mechanism for moving said port door between said opening in said isolation plate and said port door storage compartment~~; ~~said port door being slidably engaged with said unified frame, said drive mechanism for moving said port door between said I/O port and said carrier door/port door storage area.~~

9. (Currently Amended) The system as recited in claim 8, wherein said port door drive mechanism is affixed to said first vertical strut. ~~the system is mounted to a process tool such that the system is raised above the wafer fab floor and is supported by a support structure so that an open space underneath the system exists between the system and the wafer fab floor.~~

10. (Currently Amended) The system as recited in claim 8, wherein ~~the system further~~ including a wafer handling robot mounted to one of said plurality of mounting surfaces of said lower support member. ~~includes a control box mounted to said exterior mounting surface.~~

11-12. (Canceled)

13. An Equipment Front End Module (EFEM) system EFEM for transporting semiconductor wafers ~~and related substrates between a Front-Opening Unified Pod (FOUP) and a processing tool~~ SMIF pod ~~and an environment that is isolated from outside ambient conditions, comprising:~~

~~a unified frame defining a perimeter of an I/O port, including: having at least two vertical struts mounted to an upper support member and a lower support member, said frame defining an I/O port;~~

an upper support member;

a lower support member providing an interior door storage compartment, an interior mounting surface, and an exterior mounting surface;

a first vertical strut and a second vertical strut, each said vertical strut affixed to said upper support member and said lower support member;

~~a wafer engine mounted to said lower support member, said wafer engine being positioned within the environment that is isolated from outside ambient conditions;~~

~~a SMIF-pod FOUP advance assembly mounted to said exterior mounting surface, said FOUP advance assembly including a FOUP advance plate for moving the FOUP between a first position and a second position; lower support member, said pod advance assembly being exposed to the outside ambient conditions;~~

~~a SMIF-pod FOUP docking plate removably mounted to each said first vertical strut and said second vertical strut, said FOUP docking plate being substantially perpendicular to said FOUP advance plate and having an opening, said docking plate being exposed to the outside ambient conditions; and~~

~~a port door assembly including a port door being adapted to couple/uncouple a FOUP door and a port door drive mechanism for moving said port door between said opening in said FOUP docking plate and said interior door storage compartment.~~

~~said vertical struts of said unified frame provide a common reference that said wafer engine, said SMIF-pod advance assembly, and said SMIF-pod docking plate may align with.~~

14. (Canceled).

15. (Currently Amended) The system as recited in claim 13, wherein said SMIF-pod FOUP docking plate is comprises a substantially transparent material.

16. (New) The system as recited in claim 13, wherein said port door drive mechanism is affixed to said first vertical strut.

17. (New) The system as recited in claim 1, wherein said workpiece handling robot is affixed to one of said plurality of mounting surfaces.